Technics

Stereo Cassette Deck

RS-BX828

OPERATING INSTRUCTIONS

Before operating this unit, please read these instructions completely.

Accessories

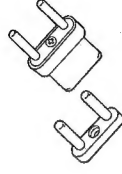The configuration of the AC power supply cord differs according to area.

- ●Stereo connection cables 2
- ●Remote control transmitter 1
- ●Remote control batteries 2
- ●AC power supply cord 1
- ●Power plug adaptor 1
  (For areas except Continental Europe)

Before Use

Be sure to disconnect the mains cord before adjusting the voltage selector.

Use a minus (−) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)

Note that this unit will be seriously damaged if this setting is not made correctly. (There is no voltage selector for some countries; the correct voltage is already set.)
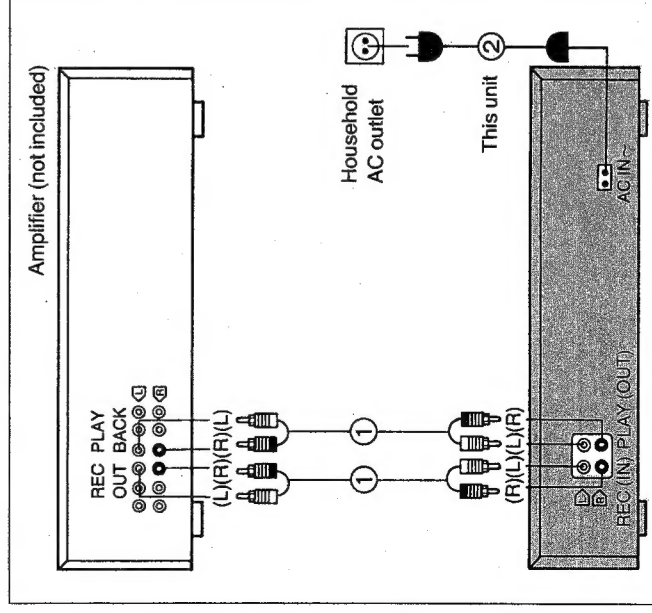
AC power supply cord (②)

The configuration of the AC outlet and AC power supply cord differs according to area.

For areas except continental Europe

If the power plug will not fit your socket, use the power plug adaptor (included).

Placement hints

If this unit is placed near a amplifier or a tuner, a "hum" noise may be heard during tape playback, recording, or AM reception of the amplifier or the tuner.

If this occurs, leave as much space as possible between the units, or place them where is the least amount of "hum".

Note:

This unit is a precision instrument. Be sure to place it on a flat surface.

Connections

Make connections in the numbered sequence by using the included cables.

① **Connect the stereo connection cables.**

Stereo connection cable   White (L)
                          Red (R)

② **Connect the AC power supply cord.**

Amplifier (not included)

REC PLAY
OUT BACK
(L)(R)(R)(L)

Household AC outlet

This unit

AC IN

(R)(L)(L)(R)
REC (IN) PLAY (OUT)

Remote Control Transmitter

Insertion of remote control batteries

Battery life is about 1 year.

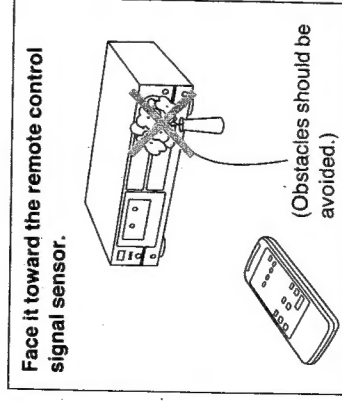Use two UM-4, "AAA" (R03) size (1.5 V) batteries.

■ Notes concerning use of batteries

● Do not use chargeable batteries (Ni-Cd type).

● Be sure the batteries are inserted so that the positive (+) and negative (−) polarities are correct. Batteries installed with incorrect polarities may leak and damage the remote control transmitter.

● Never subject the batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.

● If the remote control transmitter is not to be used for a long time, remove the batteries and store them in a cool dark place.

● Remove old, weak or worn-out batteries promptly and dispose of them.

● Never mix old and new batteries, nor batteries of different types (carbon or alkaline).
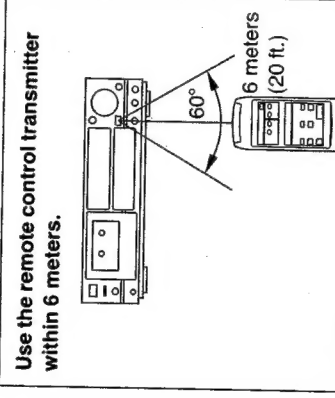
Remote control transmitter operation notes

Note that operation may not be correct if direct sunlight or other strong light strikes the remote control signal sensor. If there is a problem, place the unit away from the direct sunlight or other strong light source.
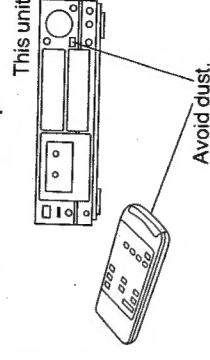
Face it toward the remote control signal sensor.

(Obstacles should be avoided.)

Use the remote control transmitter within 6 meters.

60°

6 meters (20 ft.)

Be sure the transmitter part of the remote control transmitter and the remote control signal sensor are free from dust. Excessive dust might prevent reception.
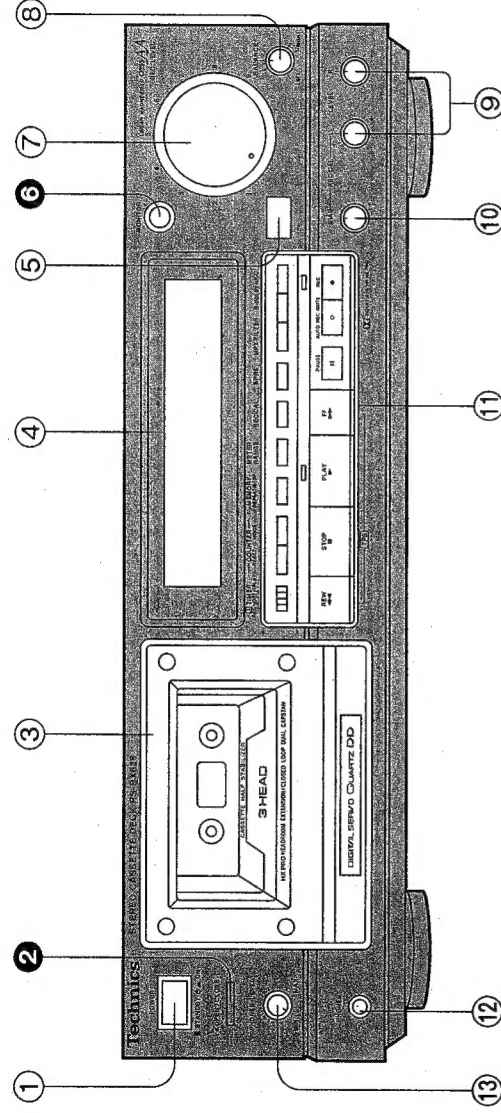
This unit

Avoid dust.

Notes:

● The control panel of the remote control transmitter may be covered by a clear plastic protective sheet. This sheet may be removed if desired.

● If this unit is installed in a rack with glass doors, the glass door's thickness or color might make it necessary to use the remote control transmitter a shorter distance from the unit.

● Do not use a remote control transmitter for a TV set, VCR or other component at the same time as this unit's remote control transmitter is being used, because this could result in an operation error.

Front Panel Controls and Functions

The functions indicated by the white numbers (with black background, ❷ etc.) can be also activated using the remote control transmitter.

Control section I

① Power "STANDBY ⏻/ON" switch (POWER ▮ STANDBY ⏻ ▬ ON)

This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the STANDBY ⏻ position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

❷ Open/close button (⏏ OPEN/CLOSE)

This button can be used to open or close the cassette holder.

③ Cassette holder

④ Indicators section

(Refer to page 7.)

⑤ Remote control signal sensor

❻ Monitor switch (MONITOR)

In order to monitor the tape (check the recording condition), the sound on the tape (immediately after recording) and the sound of the sound source (the original sound, before recording) can be alternately selected by pressing this button. (The corresponding indicator will illuminate.)

⑦ Recording-level control (REC LEVEL)

This control can be used to regulate the recording level.

⑧ Recording-balance control (BALANCE)

This control can be used to balance the left and right sound levels during recording.

⑨ Calibration-level control (REC CAL. LEVEL)

The sensitivity differences (high or low recording levels) for each tape type can be corrected by using these controls.

⑩ Calibration-bias control (REC CAL. BIAS)

The frequency response for each tape type can be equalized by using this control.
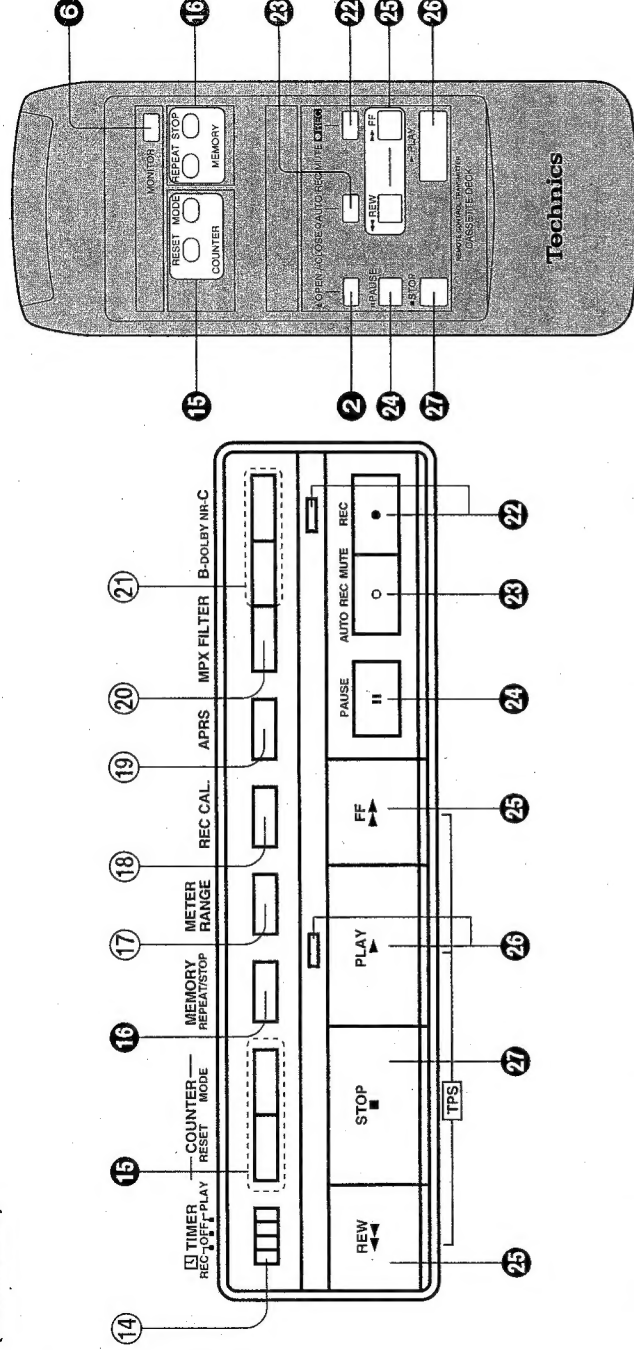
⑪ Operation section

(Refer to "Control section II" on page 6.)

⑫ Headphones jack (PHONES)

⑬ Headphones volume control (PHONES LEVEL)

Front Panel Controls and Functions

(continued)

Control section II

⑭ Timer switch (⏱ TIMER)

This switch is used to automatically begin a tape recording or tape playback at a certain time, selected by a timer (not included). (Refer to page 18.)

⑮ Counter buttons (COUNTER RESET, MODE)

RESET: This button can be used to reset the tape/linear counter indication to "000⌐/00.00".

MODE: This button can be used to select the tape/linear counter indication.

⑯ Memory-mode button (MEMORY REPEAT/STOP)

REPEAT: This button can be used to set this unit to the "A–B repeat" mode. (Refer to page 11.)

STOP: This button can be used to rewind the tape to the preset "000⌐/00.00" point when the rewind (◀◀) button is pressed. (Refer to pages 10 and 13.)

⑰ Meter-range selector (METER RANGE)

This selector can be used to select the meter-range display of the input level meter.

⑱ Calibration selector (REC CAL.)

This selector can switch the input level display between the level adjustment indicator and bias adjustment indicator.

⑲ APRS button (APRS)

This button can be used to hold the peak level while monitoring the input sound. (Refer to page 17.)

⑳ Multiplex filter switch (MPX FILTER)

This prevents the Dolby NR circuit from operating in error when FM stereo broadcasts are recorded using the noise reduction function. (Refer to pages 14 and 19.)

㉑ Dolby noise-reduction buttons (B-DOLBY NR-C)

These buttons can be used to reduce the hiss noise that is characteristic of tape. This unit is provided with both the Dolby B type and C type noise-reduction systems.

㉒ Record button and indicator (● REC)

This button can be used to change the tape deck to the recording stand-by mode.

㉓ Automatic-record-muting button (○ AUTO REC MUTE)

This button can be used to make a silent interval on the tape being recorded on tape deck.

㉔ Pause button (II PAUSE)

This button can be used to temporarily stop the tape playback or recording of tape deck.

㉕ Rewind/fast-forward/search buttons (◀◀ REW, ▶▶ FF, TPS)

These buttons can be used to fast forward or rewind the tape, or to easily search for the tune's beginning of the tape quickly.
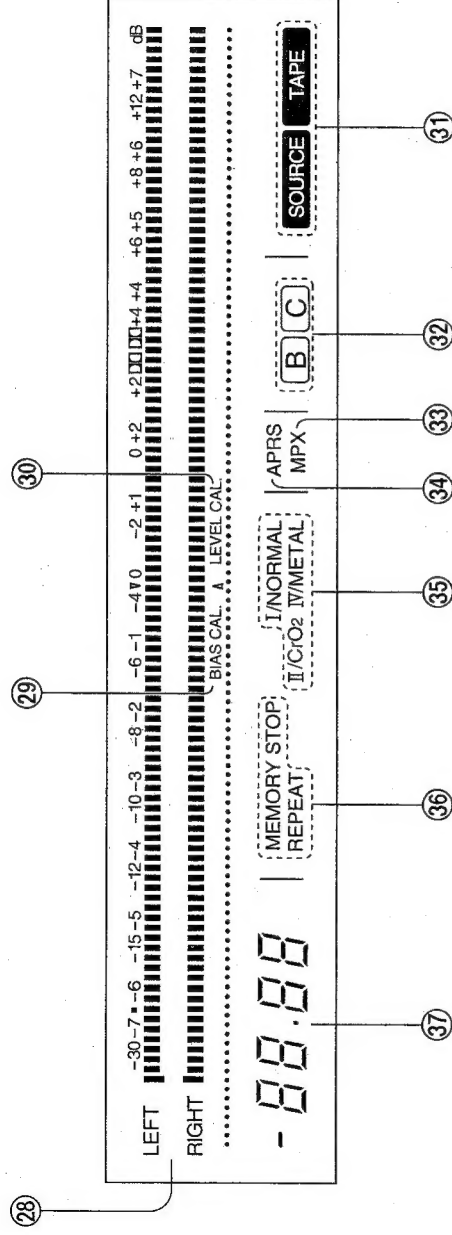
㉖ Playback button and indicator (▶ PLAY)

This button can be used to start the playback or recording of the cassette.
(The tape will then begin moving in the left-to-right direction.)
When this indicator illuminates steadily, it indicates that this tape deck is in the playback mode or the recording mode.
When it flashes continually, this is an indication that this tape deck is in the pause mode or the recording stand-by mode.
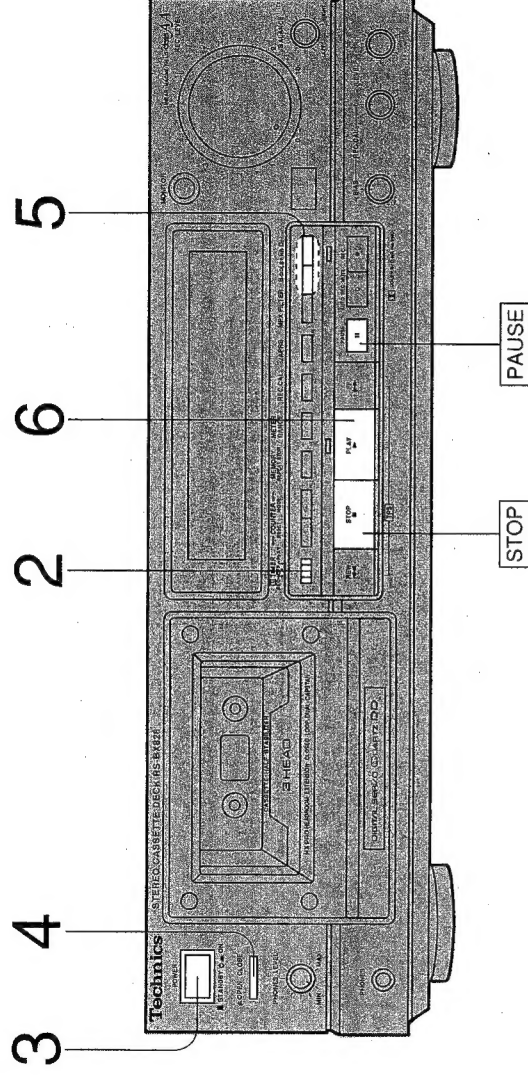
㉗ Stop button (■ STOP)

This button can be used to stop tape movement.

6

LEFT

RIGHT

dB -30-7 -6 -15-5 -12-4 -10-3 -8-2 -6 -1 -4 v 0 -2 +1 0 +2 +2 +4 +4 +6 +5 +8 +6 +12 +7

BIAS CAL. ▲ LEVEL CAL.

MEMORY STOP
REPEAT

I/NORMAL
II/CrO₂ IV/METAL

APRS
MPX

B C

SOURCE TAPE

Indicators section

28 Input level meter
During playback, this meter indicates the level of the recorded sound.
During recording, it indicates the level being recorded, adjusted by the recording-level control.

29 Bias adjustment indicator (BIAS CAL.)
Indicates that the bias can now be adjusted.

30 Level adjustment indicator (LEVEL CAL.)
Indicates that the recording level can now be adjusted.

31 Monitor indicators (SOURCE, TAPE)
Each indicator illuminates to show which of the monitor was set by the monitor switch.

32 Dolby noise-reduction indicators (B, C)
Each indicator illuminates to show the type of Dolby noise-reduction system selected by pressing one of the Dolby noise-reduction buttons.

33 Multiplex filter indicator (MPX)
Illuminates to indicate that the multiplex filter is set to "ON".

34 APRS indicator (APRS)
Illuminates to indicate that the "APRS" is set to "on" in the recording stand-by mode.

35 Tape-select indicators (I/NORMAL, II/CrO₂, IV/METAL)
The type of tape being used will be automatically detected and the indicator will illuminate.

36 Memory-mode indicators (MEMORY REPEAT, MEMORY STOP)
Each indicator illuminates to show which of the memory modes was set by the memory-mode button.

37 Tape/Linear counter
Indicates the amount of tape movement or elapsed time.

Playback

Normal play

1 Switch the amplifier ON, and select its "TAPE" input source.

2 Switch OFF the timer switch.

3 Switch ON the power of this unit.

4 Press the open/close button to open the cassette holder, and then insert the cassette tape.

(The part of the cassette where the tape is exposed should face downward.)

Press the open/close button again to close the cassette holder.

5 Press the button corresponding to the Dolby noise-reduction system (B or C) to be used.

[The Dolby noise-reduction ("B" or "C") indicator will illuminate.]

6 Press the playback button.

(The playback indicator will illuminate, and playback will begin.)

●You can close the cassette holder and begin the playback automatically, when pressing the playback, fast-forward or rewind button before pressing the open/close button to close the cassette holder.

■ **To temporarily stop playback**
Press the pause button.

(The playback indicator will begin flashing.)
To resume playback, press the playback button.

■ **To stop playback**
Press the stop button.

(The playback indicator will switch OFF.)

■ **To listen to a Dolby NR recorded tape**

Dolby noise-reduction buttons and indicators

B—DOLBY NR—C

Press the button which corresponds to the type of Dolby noise-reduction which was activated during recording.
(The Dolby noise-reduction indicator now lights).

●To switch OFF the Dolby noise-reduction system, press the button corresponding to the Dolby noise-reduction indicator that is illuminated. (The indicator will then switch OFF.)

• Counter-mode button

Normal play

■ About the Dolby noise-reduction recording/playback system

The Dolby noise-reduction system is a system designed to effectively reduce the annoying high-frequency "hissing" noise typically heard from tapes if this system is not used. During recording, the system functions to increase the level of the high-frequency part of the sound, and then, during playback, that same portion is weakened and returned to the previous level. This unit includes two types of Dolby noise-reduction systems, the Dolby B NR-type and the Dolby C NR-type, and the Dolby HX PRO headroom extension system.

Dolby B-type noise-reduction system

Noise is reduced to about one-third.
Use this system when playing back tapes recorded by the Dolby B noise-reduction system, such as prerecorded music tapes, etc.

Dolby C-type noise-reduction system

Noise is reduced to about one-tenth.
Use this system for the recording of sound sources that have a wide dynamic range and good tone quality, such as FM broadcasts of live performances, etc., and for playing back such tapes.

Dolby HX-PRO headroom extension system

By functioning to improve the maximum output level of the tape's high-frequency range, this system permits recordings without a drop of the level of the sound source's high-frequency range. In addition, by using the system in parallel with this unit's noise-reduction system, recording and playback with a greatly extended dynamic range is possible.
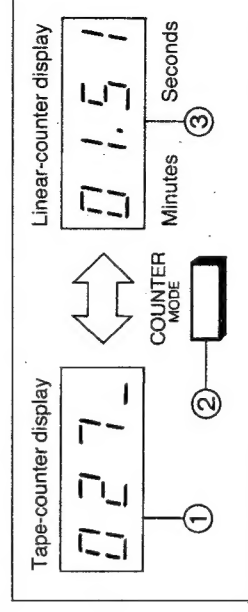
Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol ▯▯ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Tape/Linear counter display

The counter-mode button can be pressed to select either of the counter-display modes (see below): the tape-counter display or the linear-counter display. (Note that the counter display set previously appears when the unit is turned ON.)
When the counter-reset button is pressed, the counter reading is reset to either "000_" or "00.00", according to the setting of the counter display.

Tape-counter display | Linear-counter display

COUNTER MODE

Minutes | Seconds

① ② ③

① This display shows the amount of tape movement as a series of consecutive numbers.

② The display changes alternately each time the counter-mode button is pressed.

③ This display shows the amount of tape movement as expressed in minutes and seconds.

• The linear-counter display is particularly convenient when you want to know how much time is remaining for a tune now playing or you want to know how much recording time is remaining.

Notes:

• The counter reading will return to "000_/00.00" when the open/close button is pressed.

• The linear counter of this unit does not function as a clock. Depending on the length of the tape used, the diameter of the cassette's hubs, etc., there may be a difference between the time displayed by the counter and the actual recording or playback time.

Difference when an ordinary tape is played on one side from beginning to end:

Cassette type	Approx. difference
C46 (large hub), C60, C90	−30～+30 seconds
C46 (small hub)	+2 or 3 minutes

Playback (continued)

To locate and play a certain tune

■ To find a tune's beginning (TPS: Tape Program Sensor)

Press the rewind/fast-forward/search button during playback.

After the tune's beginning is located, the tune will begin playing. (The playback indicator will flash rapidly while the tune's beginning is being located.)

- For tune now playing
- (for previous tune if pressed again)
- Next tune

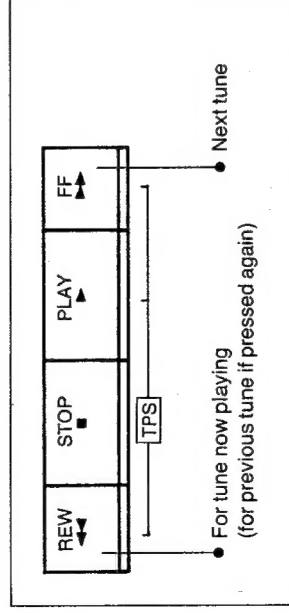To locate a certain tune that is several tunes before (or after) the tune now playing, repeat the same steps as many times as necessary.

Notes:
Note that this feature might not function correctly under the following circumstances:
- If there is noise between tunes.
- If the silent interval between tunes is less than 3 seconds.
- If there is a particularly low level of sound, or a silent interval, at any place within the tune.
- If less than 10 seconds remain until the start of the next tune.
- If a tape has been recorded with fade-ins and fade-outs.

■ To fast-forward or rewind the tape

While in the stop mode, press the fast-forward (▶▶) button or the rewind (◀◀) button.

Playback after "MEMORY STOP"

The tape is rewound to the designated point and then play can be begun from that point.

To set the playback start point

1 Press the memory-stop button and then begin the playback.
(The memory-stop indicator will illuminate.)

2 Press the counter-reset button at the point to which you want the tape to rewind.
(The counter will be reset to "000_/00.00".)

To begin playback from the set point

3 Press the stop button.

4 Press the rewind (◀◀) button.
The tape will be rewound to the set point, and then will be automatically stopped.

5 Press the playback button to begin the play-back once again.

■ To cancel the "MEMORY STOP" function Press the stop button and then press the memory stop button once again.
(The memory stop indicator will be switched OFF.)

Notes:
- The "MEMORY STOP" function can be used while either the tape counter or the linear counter is displayed, but a change from one to the other cannot be made during the "MEMORY STOP" mode.
- There may be a slight difference (maximum +4 seconds) between the point where the tape/linear counter was reset and the point where the tape actually stops after rewind.

Headphones volume control

Headphones (not included)

A ↔ B repeat play ("MEMORY REPEAT")

By simply designating the beginning ("000./00.00") and the end of the part that you want to play repeatedly, that part can be repeatedly played for as many as 16 times.
(This repeat-play feature can be used only in the playback mode.)

1 Press the playback button.
(The playback indicator will illuminate, and playback will begin.)

2 Press the counter-reset button at the place (A) where you want the repeat play to start.
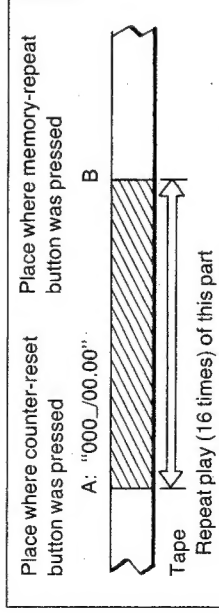(The counter will be reset to "000./00.00".)

3 Press the memory-repeat button at the place (B) where you want the repeat play to end.
(The memory-repeat indicator will illuminate.)
When the memory-repeat button is pressed, the tape will be rewound to point (A), and the repeat play will then begin.

Place where counter-reset button was pressed   Place where memory-repeat button was pressed

A: "000./00.00"   B

Tape
Repeat play (16 times) of this part

**■ To cancel the repeat-play function before it stops (after 16 repeats).
Press the memory-repeat button.**
(The memory-repeat indicator will switch OFF.)

■ To change the setting of point (B).
First cancel the repeat-play operation (see above), and then press the memory-repeat button at the new place.

Notes:
● The repeat-play function will be cancelled if the stop button or the rewind/fast-forward/search button is pressed during repeat play. To stop temporarily, press the pause button.
● There may be a slight difference (maximum ±4 seconds) between the settings made for points (A) and (B) and the points at which the tape is actually played during repeat play.

To listen through headphones

1 Set the headphones volume control to low position before connecting headphones.

2 Connect headphones (not included) to the headphones jack.

3 Use the headphones volume control to adjust the volume while listening to music.

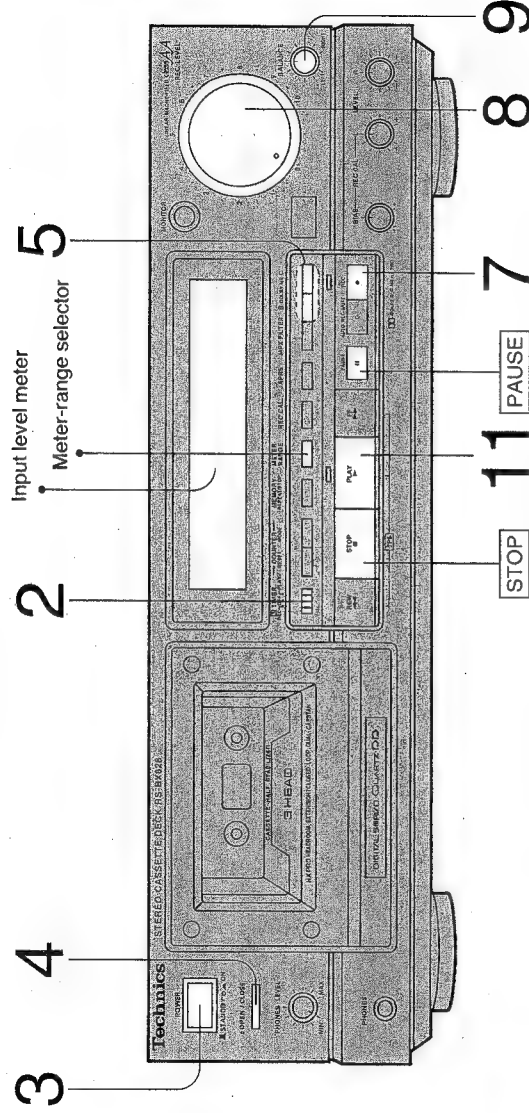Plug type: 6 mm (¼") phone plug, stereo type.

Note:
● Avoid listening for prolonged periods of time to prevent hearing damage.

Automatic-tape-select function

The unit is equipped with the automatic-tape-select feature; it automatically detects the type of tape being used, and then makes the suitable adjustments accordingly of the bias and equalization.
(The tape-select indicator will illuminate.)

Recording

Input level meter

Meter-range selector

5

2

3 4

STOP 11 PAUSE 7 8 9

Normal recording

1 **Switch the amplifier ON, and select the recording source.**

2 **Switch OFF the timer switch.**

3 **Switch ON the power of this unit.**

4 **Press the open/close button to open the cassette holder, and then insert the cassette tape to be used for recording.**
(The part of the cassette where the tape is exposed should face downward.)

Press the open/close button again to close the cassette holder.

5 **Press the button corresponding to the Dolby noise-reduction system (B or C) to be used.**
[The Dolby noise-reduction ("B" or "C") indicator will illuminate.]
If neither Dolby noise-reduction system is to be used, press the Dolby noise-reduction button corresponding to the Dolby noise-reduction indicator that is illuminated. (The indicator will then switch OFF.)

6 **The sound source to be recorded should be played before the recording is started in order to adjust the recording level.**

7 **Press the record button.**
(The recording indicator will illuminate and the playback indicator will flash continuously; the unit will be in the recording stand-by mode.)
• When the cassette with no erase-prevention tab is inserted and the record button is pressed, the cassette holder will open automatically.

8 **Adjust the recording level.**
Adjust so that the indication of the input level meter occasionally is as high as shown below.

Normal tape, CrO₂ tape	Metal tape
◻◻ (+3)	+5

For additional precision of the recording level adjustment
Press the meter-range selector to display −7 to +7 of the input level meter.
(The level will be displayed in 1 dB increments.)

9 **Adjust the left/right recording balance.**

10 **Stop the play being done so as to adjust the recording level.**

11 **Press the playback button, and begin playing the sound source once again.**
(The playback indicator will illuminate steadily, and the recording will begin.)

■ **To temporarily stop recording**
 Press the pause button.
(The playback indicator will begin flashing.)
To resume recording, press the playback button.

■ **To stop recording**
 Press the stop button.

Your attention is drawn to the fact that recording pre-recorded tapes or discs on other published or broadcast material may infringe copyright laws.

12

Monitor switch

2 1

2

1

4

To monitor a recording

The monitor switch can be used while the recording is in progress to monitor playback sound (to check the recording condition), if this unit is connected to the amplifier that has the tape monitor switch or recording selector.

Set the amplifier's monitor switch or input selector switch (on a model with a separate recording selector switch) to the "TAPE" position.

The sound being monitored (source sound or recorded sound) can be selected by pressing this button; the selected sound changes ("source" to "tape" to "source", etc.) each time the switch is pressed.
(The corresponding indicator will illuminate.)

■ "SOURCE": For sound source (input signals)
■ "TAPE": For tape sound (output signals)

Recording after "MEMORY STOP"

If the recording start position is memorised at times such as those listed below, the tape can be automatically rewound to that position and recording (or playback) can commence.
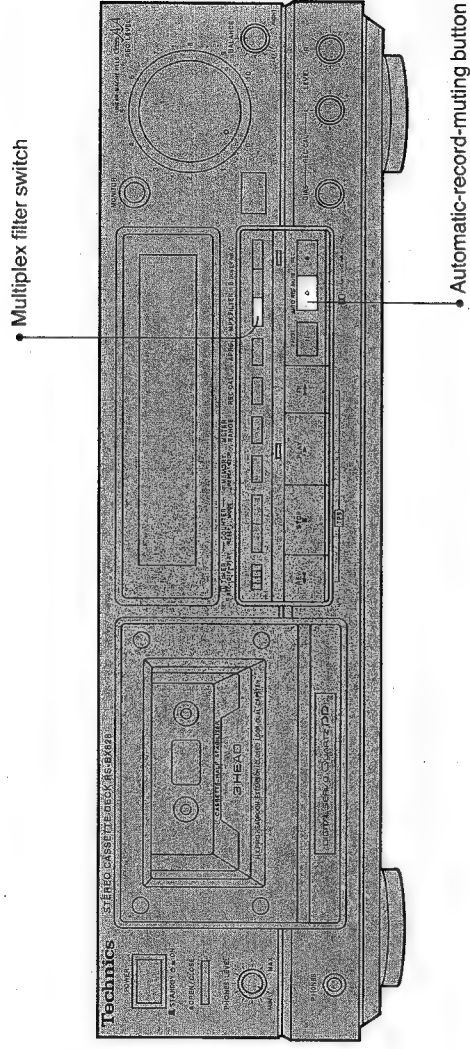●When recording is to be conducted again
●When the calibration has been adjusted (see page 15)
●When a recording is to be played back

1 Press the memory-stop button.
(The memory-stop indicator will illuminate.)

2 Press the counter-reset button.
(The counter will be reset to "000_/00.00" and the start point will be set.)

3 Follow steps 5 through 11 in "Recording" to begin the recording.
(Refer to page 12.)

4 To begin the recording again from the beginning, press the rewind (◀◀) button.
(The tape will be rewound to the set position where the counter was reset, and the tape will automatically stop.)

5 Begin the recording once again.
(Follow steps 7, 10~11 in "Recording".)

■ **To cancel the "MEMORY STOP" operation**
Press the memory-stop button once again.
(The memory-stop indicator will be switched OFF.)

Notes:
●The "MEMORY STOP" function can be used while either the tape counter or the linear counter is displayed, but a change from one to the other cannot be made during the "MEMORY STOP" mode.
●There may be a slight difference (maximum +4 seconds) between the point where the tape/linear counter was reset and the point where the tape actually stops after rewind.
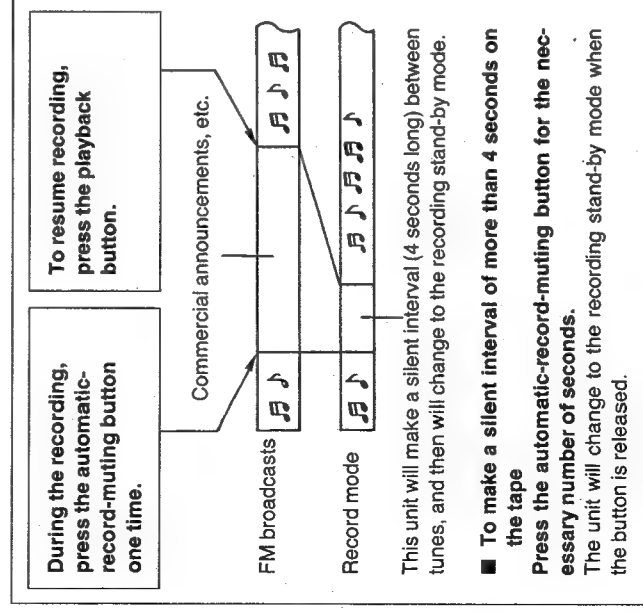
Recording (continued)

Multiplex filter switch

Automatic-record-muting button

Automatic-record-muting function

By simply pressing the automatic-record-muting button while a recording is being made, a silent (which is necessary for locating the beginning of a tune) can be made.

This feature is also convenient for omitting, during recording, unwanted material such as commercial messages, etc.

During the recording, press the automatic-record-muting button one time.

To resume recording, press the playback button.

Commercial announcements, etc.

FM broadcasts

Record mode

This unit will make a silent interval (4 seconds long) between tunes, and then will change to the recording stand-by mode.

■ **To make a silent interval of more than 4 seconds on the tape**

Press the automatic-record-muting button for the necessary number of seconds.

The unit will change to the recording stand-by mode when the button is released.
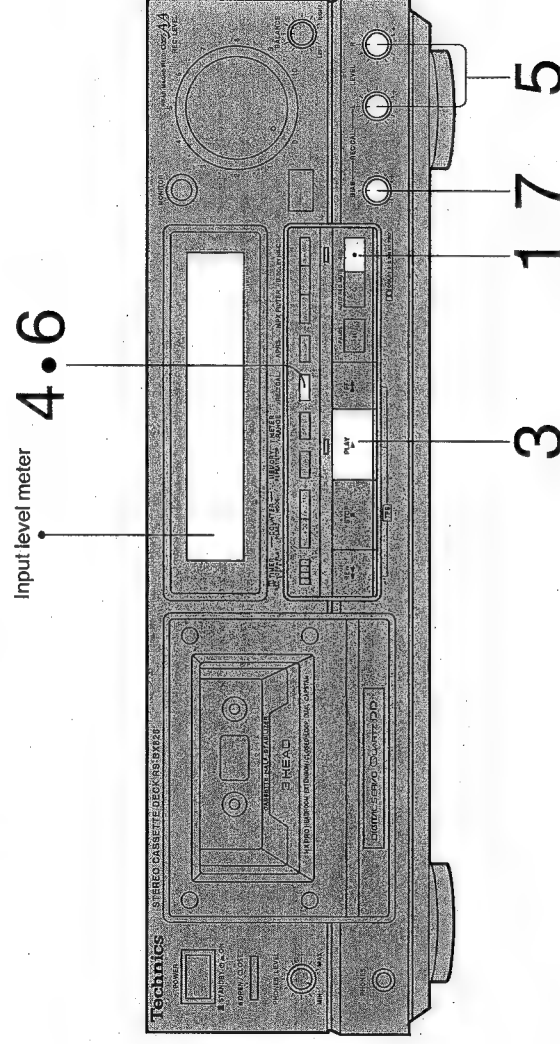
Using "MPX filter"

This switch can be used during the recording of an FM stereo broadcast that employs Dolby noise reduction so as to prevent misoperation of the Dolby noise reduction.

This switch, however, should be switched OFF when a sound source other than the FM broadcast is being recorded, such as, for example, a sound source that has a wide frequency range, such as a compact disc, etc.

Recording with High Tone Quality

Input level meter

4·6

3   1   7   5

Recording calibration

Depending on the type of tape and the brand used, cassette tapes are characterized by individual variations in sensitivity differences (high and low recording levels) and frequency responses (particularly in the high range). In addition, the recording and playback levels differ when recording is done using a noise reduction system so that the sound quality is sometimes impaired.

To deal with these problems, this unit comes with a calibration function which takes the form of bias adjustment and is based on a test oscillator. The tape's performance can therefore be given full rein by setting the optimum bias value and compensating for the sensitivity in accordance with the recording characteristics of the tape while observing the input level display.

■ Before proceeding with calibration

1 Press the record button.
(The recording indicator will illuminate and the playback indicator will flash continuously; the unit will be in the recording stand-by mode.)

2 The sound source to be recorded should be played before the recording is started in order to adjust the recording level.

3 Press the playback button.
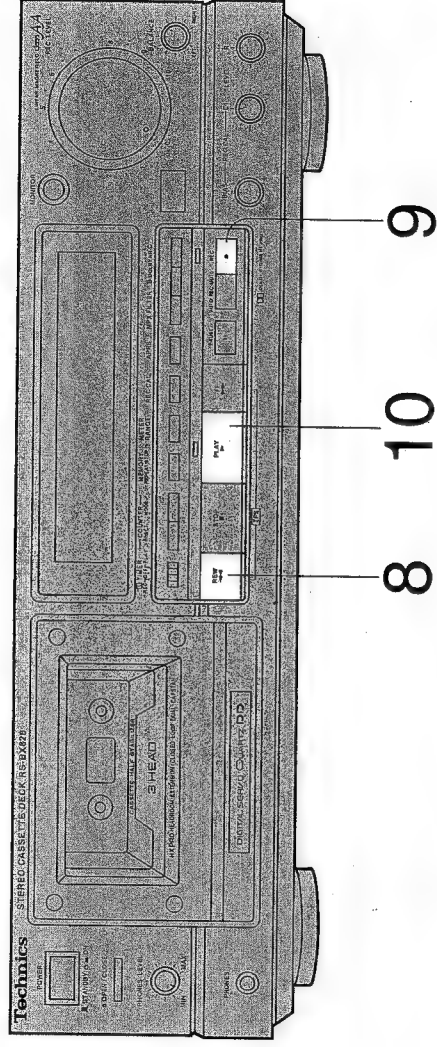(The playback indicator will illuminate steadily, and the recording will begin.)

■ Calibration procedure

4 Press the calibration selector.
[The input level display switches to the level adjustment indicator. (See the figure ① on the next page.)]

5 Compensate for the difference in the recording levels using the calibration-level control.
Adjust the left and right recording levels to the indicator arrow position. (See the figure ② on the next page.)

6 Press the calibration selector again.
[The level adjustment indicator now switches to the bias adjustment indicator. (See the figure ③ on the next page.)]

7 Compensate for the difference in the high-range sound quality using the calibration-bias control.
[Adjust the high-range recording level to the low-range recording level. (See the figure ④ on the next page.)]
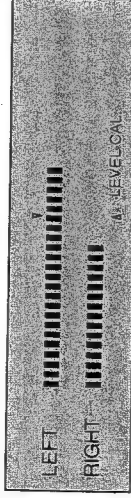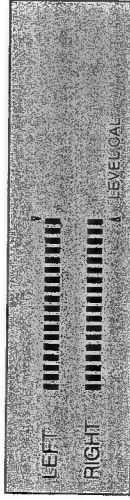
Recording with High Tone Quality

(continued)

Recording calibration

Level adjustment indicator

①

LEFT

RIGHT

LEVEL CAL

Adjust the left and right recording levels to the arrow position.

②

LEFT

RIGHT

LEVEL CAL

Bias adjustment indicator

③

LEFT

RIGHT

BIAS CAL

Adjust the high-range recording level to the low-range recording level.

④

LEFT

RIGHT

BIAS CAL

The "LEFT" side indicates the recording level of the high frequencies; the "RIGHT" side indicates the recording level of the low frequencies.

■ Starting the recording

8 Return to the original play source, and press the rewind button to rewind the tape.

9 Press the record button.
(The recording indicator will illuminate and the playback indicator will flash continuously; the unit will be in the recording stand-by mode.)

10 Press the playback button to start the recording, and start playing the source which is to be recorded.

16

Input level meter

APRS function

Because the dynamic range of cassette tape is narrower than the dynamic range of a digital source, the recording will be too noisy if the recording level setting is too low, and, conversely, the recorded sound will be distorted if the setting is too high.

It was for this reason that it has always been recommended that the signals to be recorded be first (before recording) input to the cassette deck and the recording level then be set while watching the level meter, but, for former conventional level meter equipped with the peak-hold function, it was necessary to re-adjust and input the signals again if the level setting was too high or too low.

This unit, however, is equipped with the **APRS: Advanced Precise Recording-level System**, which holds and displays the maximum peak of the input signal level, so that once the peak level of the source is held, there is no necessity to re-input the source signals, and the optimum recording level can be set.

• The APRS function can be used only during the recording-standby mode.

1 Prepare for recording as described in steps 1 to 6 of the "Recording" section.
(Refer to page 12.)

2 Press the record button.
(The recording indicator will illuminate and the playback indicator will flash continuously; the unit will be in the recording stand-by mode.)

3 Set the recording-level control and the recording-balance control to the suitable position for the sound source.

4 Press the APRS button.
(The APRS indicator will illuminate.)

5 Play the sound source to be recorded, from beginning to end.
[The peak level (the highest level of the input signal) of the sound source will be displayed and held on the input-level meter.]

Input level meter

Peak level

Note:
The range within which the peak level can be held is −6 dB to +12 dB. Note that the APRS indicator will flash continuously if the peak level of the sound source is input at a level that exceeds the maximum recording level (+12 dB).

If that happens, press the APRS button to cancel the APRS function, and then reset the recording level and set the APRS once again.

6 Using the recording-level control, adjust the peak level to the desired setting.
The peak level will move to the right when the recording-level control is turned to the right, and will move to the left when the recording-level control is turned to the left.

• The recording-balance control cannot be used to adjust the peak level.

7 Stop the play being done so as to adjust the recording level.

8 Start recording, then start playing the source to be recorded from the beginning.
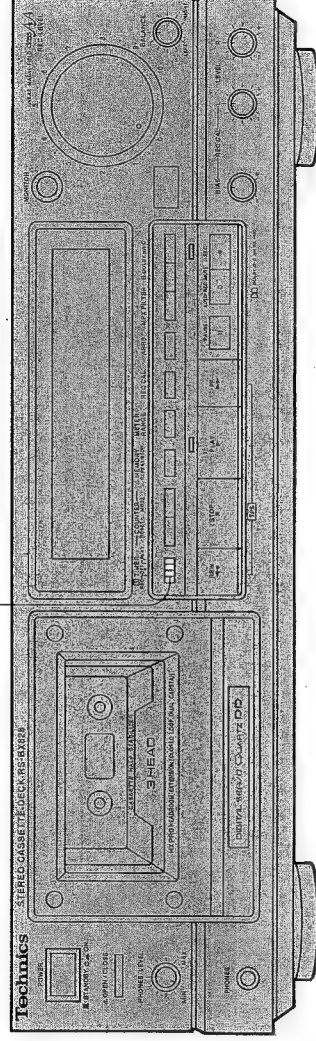(The playback indicator will illuminate steadily, and the recording will begin.)

The APRS indicator will switch OFF, and the indication of the input-level meter will return to the ordinary peak-hold mode.

Timer Recording/Playback

⏲ TIMER
REC◀OFF▶PLAY

If an audio timer (not included) is connected to this unit, recording of a radio broadcast, or tape playback, will automatically begin at the preset time. Timer recording or playback is also possible by using a tuner with timer.
Connect the AC power supply cord of this unit to the power source outlet of the timer. (See the operating instructions of the timer for detailed information.)

Timer recording

1 Prepare for recording.
Follow steps 1 through 9 of "Recording" on page 12. After adjusting the recording level, press the stop button.

2 Set the timer to the desired recording-start timer.
(Power "STANDBY ⏻/ON" switch will be "STANDBY ⏻" position.)

3 Set the timer switch to the "REC" position.

⏲ TIMER
REC◀OFF▶PLAY

(At the set time, the power "STANDBY ⏻/ON" switch will come on and the broadcast will be recorded.)

■ After setting the timer
Check to be sure that the power "STANDBY⏻/ON" switch is set to the "ON" position.

When timer recording has ended, set the timer switch to "OFF".

Timer playback

1 Rewind the tape to the position from which you want playback to begin.
(Refer to page 10.)

2 Set the timer to the desired playback-start time.
(Power "STANDBY ⏻/ON" switch will be "STANDBY ⏻" position.)

3 Set the timer switch to the "PLAY" position.

⏲ TIMER
REC◀OFF▶PLAY

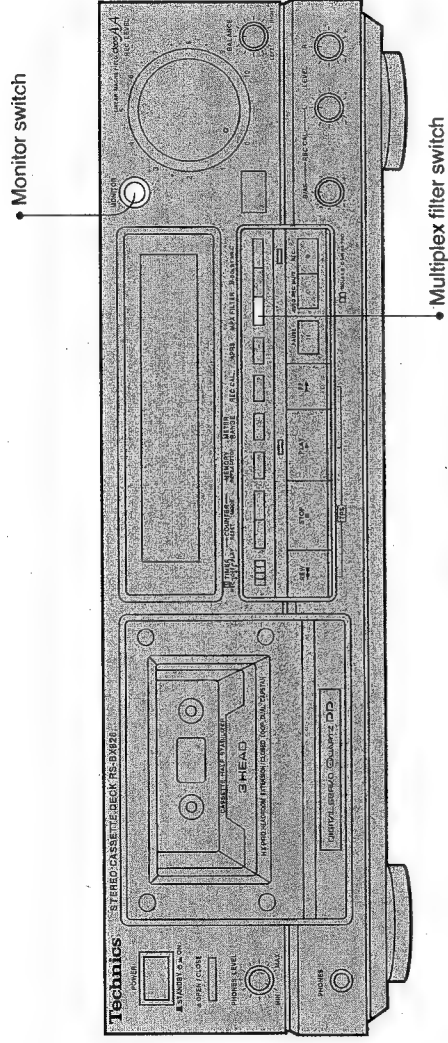(At the set time, power "STANDBY ⏻/ON" switch will come on and the playback will begin.)

■ After setting the timer
Check to be sure that the power "STANDBY ⏻/ON" switch is set to the "ON" position.

When timer playback has ended, set the timer switch to "OFF".

Technical Information

Monitor switch

Multiplex filter switch

MPX filter

Because the pilot signals*, etc. included with FM stereo broadcast signals are subjected to Dolby noise-reduction processing in the same way as the music signals when an FM stereo broadcast is being recorded, there is apt to be deterioration of the tone quality, and the noise-reduction effect is reduced.
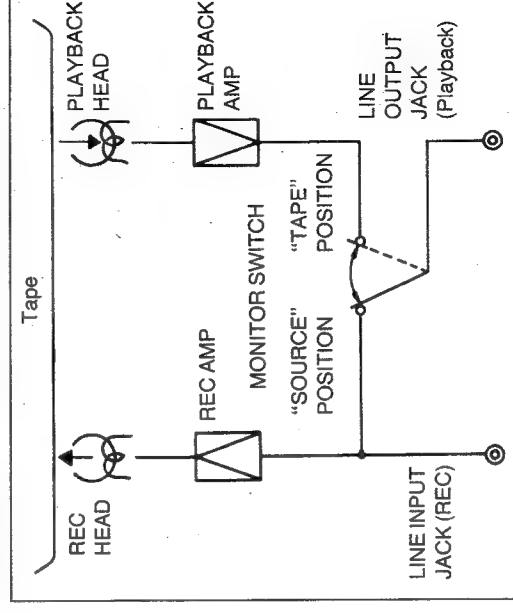
This unit, however, is provided with an MPX filter that filters out the 19 kHz frequency, which is the frequency of the pilot signal. Note that there is virtually no audible effect upon the tone quality as a result of the use of the MPX filter.

*Pilot signal
The pilot signal is a signal that is used to separate FM broadcast signals in stereo (left and right channels); this signal is generated on a frequency that is very close to the 19 kHz music band.

Monitor Switch

This unit is of 3-head type, and the record head is independent of the playback head. Also, the sound before recording can be compared with the recorded sound by use of the monitor switch, therefore the state of recording can be easily checked.
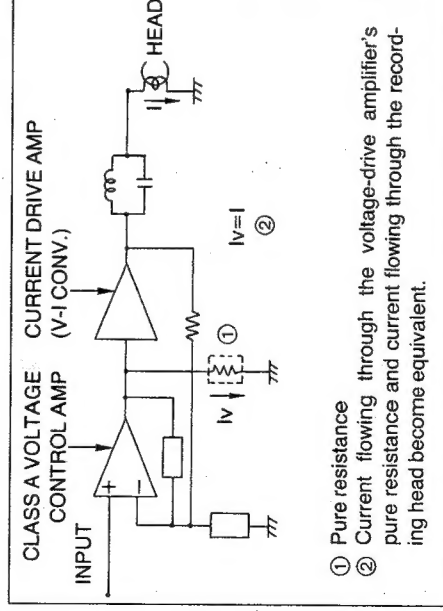
LINEAR MAGNE-FIELD class A/A

The recording-equalizer amplifier is an amplifier for supplying (to the head) the current necessary for recording. Usually, loads such as the recording head and bias trap circuitry (circuitry for control of the bias current) would be applied to the output of this amplifier, with the result that complex changes of the current phase occur, causing distortion of the recording signal.

The recording-equalizer amplifier used in this unit, however, is a linear magne-field class AA amplifier that is a combination of class A voltage-control amplifier circuitry and current-drive amplifier circuitry. (See the figure below.) As a result, a current flow that is equivalent to the current flowing in the pure resistance of the voltage-drive amplifier can be supplied to the recording head. Consequently, a magnetic field that corresponds to the input signals is produced at the head and is recorded on the tape, which means that recorded sound are faithful to the original sound source, without fluctuations of the current phase.

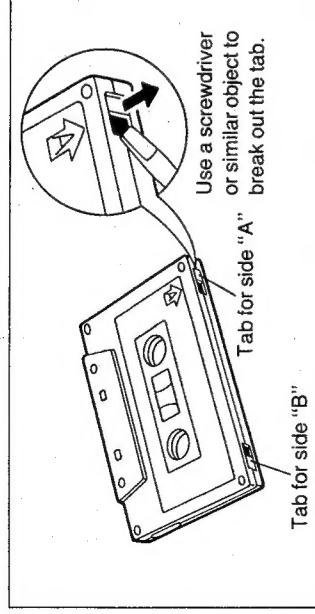
CLASS A VOLTAGE CONTROL AMP
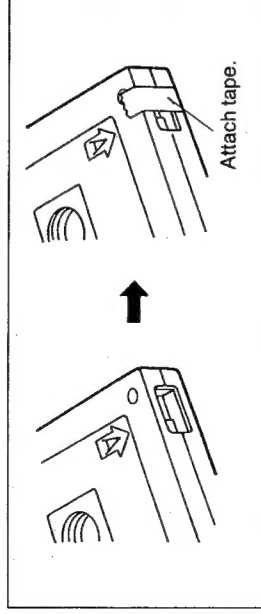
CURRENT DRIVE AMP (V-I CONV.)

INPUT

$Iv=I$ ②

Iv ①

HEAD

① Pure resistance
② Current flowing through the voltage-drive amplifier's pure resistance and current flowing through the recording head become equivalent.

After Recording

To prevent erasure of recorded sounds

Remove the erase-prevention tabs (thus preventing recording).

Use a screwdriver or similar object to break out the tab.

Tab for side "A"

Tab for side "B"

■ To re-record on a protected cassette

Block up the hole by adhering a piece of cellophane tape to the area where the erase-prevention tab was broken out.

Attach tape.

To erase recorded sounds

When new recordings are made on a recorded tape, all sounds recorded on that portion of the tape are automatically erased. To erase a tape without making a new recording, follow the steps below.

1 Insert the recorded cassette into the cassette holder of tape deck.

2 Set the recording-level control to "0".

3 Press the Dolby noise-reduction button corresponding to the Dolby noise-reduction indicator that is illuminated.
(This indicator will then switch OFF.)

4 Press the record button.

5 Press the playback button.

About Cassette Tapes

Avoid the following types of tapes

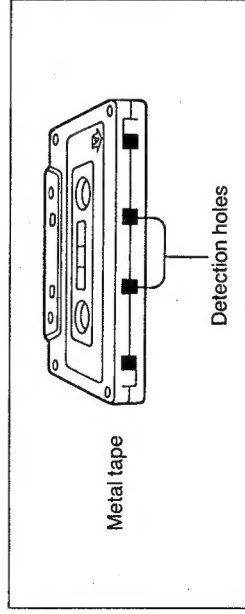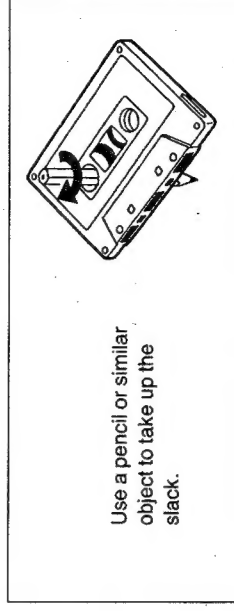**•Cassette tapes exceeding 90 minutes**
These tapes are handy for their long playback and recording time but be careful about repeatedly stopping and starting, rewinding and fast forwarding these tapes in short intervals as they are thin, tend to stretch and may become entangled in the machine.

•Fe-Cr tape (TYPE III)
The high range will be emphasised and a flat frequency response characteristic cannot be obtained.

•Metal tape without detection holes in the cassette
Recordings will be very distorted. (There is no playback problem, however.)

Metal tape

Detection holes

Notes about the handling of cassettes

If the tape in the cassette is loose, the tape can easily break during use or otherwise be damaged.
Never touch the tape itself, or attempt to pull it out of the cassette.

Use a pencil or similar object to take up the slack.

Avoid tape storage in the following places

Tape can be damaged if it is stored in places such as described below.
•Where the temperature is high (95°F/35°C or higher) or where the humidity is high (80% or higher).
•Where there is a strong magnetic field (near a speaker, on top of a TV, etc.).
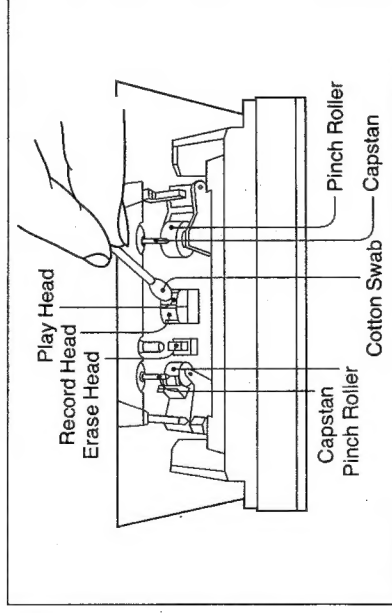•In direct sunlight.

Maintenance

Head care

To assure good sound quality for recording and playback, be sure to clean the heads after approximately every 10 hours of use.

1) Press the open/close button to open the cassette holder.
2) Press the power "STANDBY ⏻/ON" switch to turn the unit off.
3) Clean the heads, pinch roller and the capstan shaft with a cotton swab (or with a soft, lint-free cloth) slightly moistened with alcohol.

Do not use any solution other than alcohol for head cleaning.

Play Head
Record Head
Erase Head
Pinch Roller
Capstan

Capstan
Pinch Roller
Cotton Swab

Head demagnetisation

In order to maintain good sound quality during recording and playback, it is recommended that the heads should be demagnetised if distortion or poor sound quality persist after cleaning the heads. If the heads become magnetised, they could create noise in recordings, loss of high-frequency response, or erasure of valuable recordings. Several types of head demagnetisers are available and may be purchased at local electronics supply stores. Follow the instructions that are supplied with the device.

● Do not bring any type of metal objects or tools such as magnetic screwdrivers in contact with the head assembly.

Maintenance of external surfaces

To clean this unit, use a soft, dry cloth.
For very dirty surfaces, dip a soft cloth in a weak soap-and-water solution and wring well. After cleaning, wipe with a soft, dry cloth.
Never use alcohol, paint thinner, benzine, or a chemically treated cloth to clean this unit.
Such chemicals may damage the unit's finish.

Technical Specifications

■ CASSETTE DECK SECTION

Deck system	Stereo cassette deck
Track system	4-track, 2-channel
Recording system	AC bias
Bias frequency	80 kHz
Erasing system	AC erase
Heads	Recording head (Permalloy) ×1
	Playback head (Permalloy) ×1
	Erasing head (Double-gap ferrite) ×1
Motors	Capstan drive (Quartz DD motor) ×1
	Reel table drive (DC motor) ×1
	Cassette holder open/close (DC motor) ×1
Tape speed	4.8 cm/sec.
Wow and flutter	0.03% (WRMS)
	±0.09% (DIN)

Fast forward and rewind times
Approx. 100 seconds with C-60 cassette tape

Frequency response (Dolby NR off)

NORMAL	30 Hz~17 kHz, ±3 dB
	20 Hz~18 kHz (DIN)
CrO₂	30 Hz~18 kHz, ±3 dB
	20 Hz~19 kHz (DIN)
METAL	30 Hz~19 kHz, ±3 dB
	20 Hz~20 kHz (DIN)

S/N (Signal level=max recording level, CrO₂ type tape)

NR off	57 dB (A weighted)
Dolby B NR on	66 dB (CCIR)
Dolby C NR on	74 dB (CCIR)

Input sensitivity and impedance
REC (IN)   60 mV/47 kΩ

Output voltage and impedance

PLAY (OUT)	400 mV/800Ω
HEADPHONES	125 mV/(8Ω)
	(Load impedance 8Ω~600Ω)

■ GENERAL

Power consumption	22 W

Power supply
For continental Europe   AC 50 Hz/60 Hz, 230 V~240 V
For others   AC 50 Hz/60 Hz, 110 V/127 V/220 V/240 V

Dimensions (W×H×D)	430×135×300 mm
Weight	5.3 kg

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

Troubleshooting Guide

Before requesting service for this unit, check the chart below for a possible cause of the problem you are experiencing. Some simple checks or a minor adjustment on your part may eliminate the problem and restore proper operation.
If you are in doubt about some of the check points, or if the remedies indicated in the chart do not solve the problem, refer to the directory of Authorized Service Centers (enclosed with this unit) to locate a convenient service center, or consult your dealer for instructions.

Problem	Probable cause(s)	Suggested remedy
While using the tape deck		
Tape moves but no sound is heard.	The volume control of the amplifier is set to its minimum position.	●Adjust the volume control to the desired level.
	The input selector of the amplifier is not set the "TAPE" position.	●Set to the "TAPE" position.
	"REC (IN)" and "PLAY (OUT)" stereo connection cables have been connected in reverse.	●Connect them properly.
Distorted sound.	The recording level is too high.	●Select the appropriate recording level.
Previously recorded sound has not been erased.	Erase head is dirty.	●Clean the head.
Sound output is hoarse or unsteady.	Heads are dirty.	●Clean the heads.
	Tape is damaged.	●Try operation with a new cassette; if there is no problem with the new cassette, discard the damaged cassette.
Poor sound quality (especially in the high treble and low bass ranges).	The correct Dolby noise-reduction button is not set.	●Set it to the correct position.
Sound is low, poor tone, intermittent sound, noise.	Heads, capstan and/or pinch roller are dirty or tape is damaged.	●Clean the heads, capstan and/or pinch roller, or try operation with a new cassette.
Recording is not possible.	The recording level control is at the "0" position.	●Select the appropriate recording level.
	No erase-prevention tab on cassette tape.	●Block up the hole by adhering a piece of cellophane tape to the area where the erase-prevention tab was broken out.
Operation by remote control transmitter is not correct.	The remote control batteries are consumed.	●Replace them with new batteries.
	There is an obstruction between the remote control transmitter and this unit.	●Remove the obstruction.
	The batteries have been inserted incorrectly. [The (+) and (−) polarities are reversed.]	●Insert so that the polarities are correct.

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